

CLAIMS

1. DNA comprising one or more genes specific for 5S clavam biosynthesis in *S. clavuligerus* and which is not essential for 5R clavam biosynthesis.
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2. DNA according to claim 1 as identified in Figure 1 (SEQ ID No: 1).
3. DNA according to claim 1 having the sequence or substantially the sequence shown in Figure 1 as orfup3, orfup2, orfup1, orfdwn 1, orfdwn2 or orfdwn3 (SEQ ID
- 10 Nos: 2-7).
4. DNA according to claim 1 having the sequence or substantially the sequence shown in Figure 1 as orfup1 (SEQ ID No: 4).
- 15 5. DNA which hybridises under conditions of high stringency with the DNA of claim 1.
6. A vector comprising the DNA of claim 1 in which one or more of the genes specific for 5S clavam biosynthesis has been disrupted or otherwise made defective.
- 20 7. A vector according to claim 6 containing one or more defective genes which is pCEC060, pCEC061, pCEC056 or pCEC057.
8. A vector according to claim 7 which is pCEC061.
- 25 9. A host containing the vector of claim 6.
10. A host according to claim 9 which is capable of producing raised levels of clavulanic acid.
- 30 11. A host according to claim 9 which is capable of producing low or no levels of 5S clavam.

12. A host according to claim 9 which is *S. clavuligerus*.
13. *S. clavuligerus* comprising DNA corresponding to an open reading frame
5 flanking cas1 which DNA has been disrupted or otherwise made defective.
14. *S. clavuligerus* according to claim 13 wherein the open reading frame is
selected from the group consisting of orfup3, orfup2, orfup1, orfdwn1, orfdwn2 and
orfdwn3.
- 10 15. A process for improving 5R clavam production in a suitable microorganism
comprising manipulation of DNA as defined in claim 1 and its inclusion in the
microorganism.
- 15 16. A process according to claim 15 wherein said suitable microorganism is *S.*
clavuligerus.
17. A process for improving 5R clavam production in *S. clavuligerus* comprising
disrupting or otherwise making defective DNA regions flanking cas1.
- 20 18. A process according to claim 15 wherein said DNA corresponds to open
reading frames selected from the group consisting of orfup3, orfup2, orfup1, orfdwn 1,
orfdwn2 and orfdwn3.
- 25 19. A process according to claim 15 wherein said DNA corresponds to open
reading frame orfup1.
20. A process according to claim 15 wherein said 5R clavam is clavulanic acid.
- 30 21. A process for the identification of a microorganism suitable for high 5R clavam
production comprising a preliminary screening for microorganisms with low or no 5S
clavam production.

22. A process according to claim 21 wherein the microorganism is *S. clavuligerus*.
 23. A process according to claim 22 wherein the 5R clavam is clavulanic acid.
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24. A process according to claim 21 wherein one or more genes specific for the production of 5S clavams is defective.
 25. A microorganism which is capable of 5R clavam production and low or no 5S
- 10 clavam production obtainable by the process of claim 15.
26. A microorganism obtainable by the process of claim 25 which is capable of producing clavulanic acid but which does not produce clavam-2- carboxylate.
 27. A microorganism obtainable by the process of claim 25 which is capable of
- 15 producing clavulanic acid but which does not produce 2-hydroxymethylclavam.
28. A microorganism obtainable by the process of claim 25 which is capable of producing clavulanic acid but which does not produce clavam-2- carboxylate and 2-
- 20 hydroxymethylclavam.
29. A microorganism obtained by the process of claim 15 which is strain 56-1A, 56-3A, 57-2B, 57-1C, 60-1A, 60-2A, 60-3A, 61-1A, 61-2A, 61-3A or 61-4A.
 30. Clavulanic acid obtainable by the fermentation of a microorganism as defined in
- 25 claim 25.
31. Clavulanic acid according to claim 30 which is free of clavam-2-carboxylate.
 32. Clavulanic acid according to claim 30 in the form of its potassium salt.
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33. Clavulanic acid which is free of any 5S clavam.

34. Clavulanic acid which is free of any clavam-2-carboxylate.
35. A composition comprising potassium clavulanate according to claim 32 in
5 combination with a beta-lactam antibiotic.
36. A composition according to claim 35 in which the beta-lactam antibiotic is amoxycillin.
- 10 37. A process for the preparation of a composition comprising potassium clavulanate and amoxycillin which process comprises producing clavulanic acid from a microorganism according to claim 25 and thereafter converting it to the potassium salt and combining the potassium salt with amoxycillin.